COMPUTERWORLD

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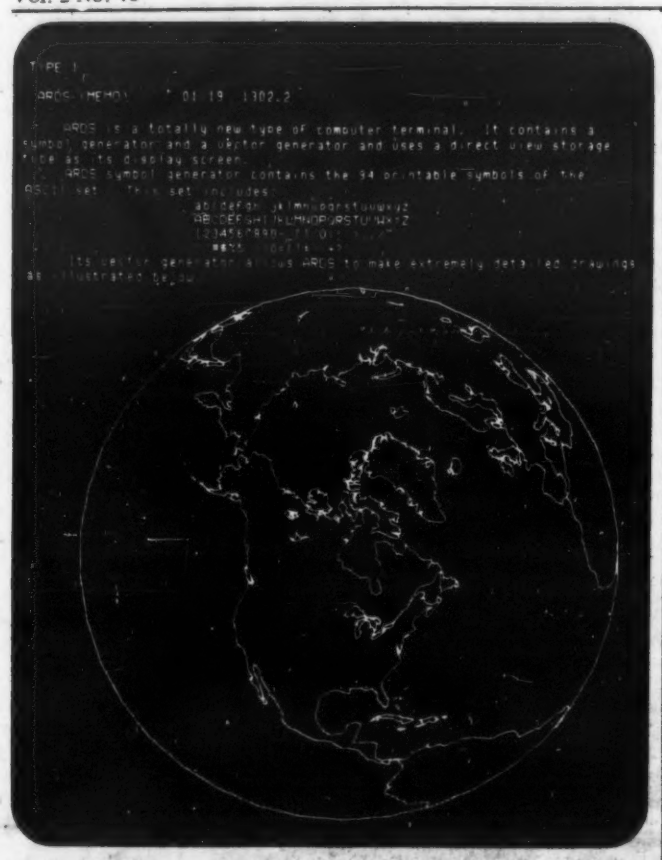

Both characters and line drawings can be plotted on the new display. This unretouched photo was made by MIT.

Terminal Display Handles Characters and Drawings

WALTHAM, Mass. – A new desk top computer display which can handle both drawings and characters is available from Computer Displays Inc. Designed to operate over standard telephone lines, Ards (Advanced Remote Display Station) sells for $12,750. The company claims that it is the first desk top system which has both assembly drawing and full vector capability. As such they believe it to be attractive as a remote time sharing terminal or as a directly coupled graphic display on any computer.

The width of the screen is 80 characters, allowing teletypewriter software to handle the lines without folding them. The company believes that only minor changes to standard software for teletypewriters would be needed to operate the new unit.

Two graphic display inputs available for the unit are a small "joystick" which controls the position of a spot of light on the screen, and a "mouse," which can track over drawings on the surface of the desk. The advantage of the "mouse" is that it can trace, very precisely, any sort of diagram or drawing that requires desk space. By contrast, the "joystick" uses little desk space and is particularly useful for positioning the light spot on the display.

Computer Time Saved

Both systems are used in preparing programs for display. The major advantage of these inputs over a light pen is the reduction in the amount of computer time used. The computer must track a light pen at all times while it is on the face of the scope. With Ards, by contrast, the operator, using his keyboard, defines only one input to the system for each line, or point, to be used.

The system currently is operating with 1620s and 1130s.

One problem does occur with this system, however. It requires a full 500 milliseconds for the

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GSA Warns Industry: Provide Cost Figures

WASHINGTON, D.C. – A spokesman for the General Services Administration told a congressional committee here that if the GSA did not receive cost data from the computer industry voluntarily next year, then it would promote legislation to force the industry to provide it.

It is commonly believed that the industry would like to keep its cost figures secret because of the lack of an easily understandable ratio between the hardware costs and the purchase and rental prices charged to users.

Lawson B. Knott, Jr., GSA administrator of general services, speaking before the Proxmire subcommittee on economy in government, said that while the Truth in Negotiations Act called for these details to be provided, particularly in cases where the computer was not yet on public sale, the computer industry had refused on the basis that even though they are not available yet, the computers are at least potentially part of the commercial line. He also said that where the cost was the lowest offered, and the equipment met government requirements, the agency had no choice but to waive the requirement to submit these costs.

In other testimony before the subcommittee, Knott said that the government had 3905 computers in service last June, as compared with 3692 a year earlier. The time sharing program, under which agencies do work for other agencies, is estimated to have saved $22 million in 1968 (up from $17 million).

He also dealt with the problem of peripheral procurement, and said that the GSA had entered into contracts with two of the 50 firms whose names were provided to the subcommittee last December by Richard Caveney of Bryant Computer Products and were negotiating with seven others.

Estimated Breakdown

While the price breakdown for computers is not known with any certainty, industry sources use rule-of-thumb figures for the hardware, marketing, and maintenance costs. The hardware generally falls somewhere between 15 and 20%, with marketing around 25%. The maintenance costs are normally estimated to be around 15%.

Software estimates fall into no fixed pattern. Sometimes estimates are as low as 2% – sometimes as high as 15%. Equally, although there are estimates used for development and profit percentages, the individual estimates show no agreement among themselves.

'Computerized' Turkey

The computer didn't hatch this Thanksgiving turkey, but it did tell the Mountaire Poultry Co., DeQueen, Ark., how to make it plump and tasty. The company inputs data on basic nutritional requirements and the computer chooses from among the cheapest ingredients available at that time and prescribes a feeding formula.

MIT Dedicates New Processing Center

CAMBRIDGE, Mass. – One of the largest university computer centers in the world was dedicated here last week at the Massachusetts Institute of Technology. The new six story, $3 million Information Processing Center will serve as a key element in MIT's growing network of interconnected computers.

The center succeeds the MIT Computation Center established in 1956. The new center emphasizes information processing in contrast to computation, reflecting the changing and broadening role of computers within the university.

Already located in the new center is a coupled IBM 360/65-40 computer complex. The system is primarily doing batch processing, with the Model 40 acting as a system traffic controller. Also installed is an IBM 360/67 which is being used by MIT's Urban Systems Laboratory. The Model 67 will allow many scientists and engineers working on urban problems at MIT to have access to its computing power simultaneously by specifying through the CP67 control program the "virtual" computer configuration needed for a particular job.

MIT Created Need

In a sense MIT itself created the need for change in its information processing program. MIT's Project Mac (for Machine Aided Cognition and Multiple Access Computer) was organized in 1963 to exploit time sharing and enlarge the ways in which computers can aid humans in their cognitive processes.

As Mac developments became available, they were incorporated into the services available from the center. MIT now has more than 200 remote terminals scattered about the campus

Within the next few months, the time shared IBM 7094 will be

(Continued on Page 16)

David and Goliath

One view of the computer's role in the National Data Bank is shown here. It was extracted from the campaign literature supporting Rep. Cornelius Gallagher for re-election. He won.

360/85 Performance Claims Are Changed

Special to Computerworld

WHITE PLAINS, N.Y. – The instruction timings of the 360/85 originally published by IBM were obsoleted when a new edition of the functional specification manual was published recently. At the same time IBM said that it had evaluated some programs using the new timings, and that this showed that the timings, while the best currently available, were still liable to be out by up to 28-1/2%. Overall the changes in the timings appeared to hurt commercial users while possibly improving the scientific performance of the system.

At the time of the original announcement, *Computerworld* severely criticized the performance claims made in the manual and in other literature.

Improved Multiply

The two major changes were in the multiply times, and in the time involved in retrieving data from core storage. The multiply timings for the basic unit were improved by between 10% and 26%, and the high speed multiply also appeared to be giving faster performance than originally had been announced in the Technical Report on the 360/85.

Slower Core Access

However, a more serious problem arose in the larger models which use four way interleaving. The 360/85 has a two level store, with most data being held in the core memory but with some of the data currently in use being held in a very fast (80 nanosecond) memory. When the program needs an item not already in the fast memory, the original specifications stated that only 11 cycles (880 nanoseconds) of extra time were involved. Under the revised data, this has been increased to 15 cycles – an increase of about 36%.

Commercial Programs Hurt

The effect of the new timings appears to be to reduce the system's performance on access dependent programs. Examples of simulated timing showed that applications such as compilations, sorts, and link-edits appeared to be limited by the ability of the system to gain access to the data in the core units. These were contrasted with scientific applications which were improved by the use of the high speed multiply.

The size of the degration can apparently be quite serious, as even when the 36% increase in the core storage timings is used to create the new program times, these themselves can still be underestimated by 28-1/2%, according to the new manual. In worst-case conditions this means that a program which could have been expected to run in one hour under the old timings may now take an hour and 40 minutes and still fall within the new timings.

Ampex Schedules First Deliveries Of Tape Drives

REDWOOD CITY, Calif. – Ampex Corp. plans to begin deliveries in December of a complete tape memory system compatible with IBM equipment.

Priced at about $3500, the TM-Z system costs about half of what a previous complete system of its size and performance did, Ampex said.

Offered in 7 and 9 track versions, with tape speeds up to 24" a second, the system is expected to allow users to obtain tape memory systems more economically than buying components and building their own, Ampex said.

Election Problems as Seen by the Press

The press coverage of computers and their conduct during the presidential election continued last week. In general the opinions were either condemnatory or rather on the defensive. There were indications, however, that more extreme viewpoints, for and against computers in elections, were held in various quarters. It seemed agreed, however, as *Newsweek* put it, that computers are in the election process to stay – just as much (and perhaps more than) the polling booth.

The Case for Computers

The case for the computers was made best by the electronics industry weekly paper, *Electronic News*. The *News* aimed at the fact that no hardware failures of significance had been identified, and quoted J.R. Eimers of the News Elections Service as saying he was convinced it was a programming error. From this the *News* made the jump to say it was, therefore, a case of human – rather than machine errors – that had been involved.

Case Against Computers

This argument was taken up, and answered, in the newspaper industry trade publication, *Editor & Publisher*. "Computers were the real losers in this week's presidential election," was the opening sentence of the editorial. The writer went on to show that he understood the difference between hardware and software, and regarded them as a single entity.

Other Views

While the events of the past were taking up the most space in the news and editorial columns, the election also caused some people to look into the future, and to consider the role of computers in elections in the years to come. Don Maclean, a syndicated columnist, gave the computers credit for focusing the nation's attention on the curious delaying practices which occurred in Cook County, Ill., and said that now these were widely known, he hoped that the FBI would step in and investigate. His argument appeared to be that computers could lead to a reduction in corruption because the timing of vote counting would be kept so low the elections officials would not have time to falsify the counts.

This rosy view of computers, however, was directly disputed by Phyllis Huggins, a computer industry commentator. In her newsletter, *Computing Newsline*, Mrs. Huggins claimed that IBM apparently has two wishes on changing the voting process to ease the task for computers: one to outlaw write-ins, and the other to have key precincts close one hour earlier (as was evidently done in Nebraska). To dramatize her opposition to these changes in the process, she quoted a veteran poll inspector as saying that the inability of people to write in candidates could "lose your democracy."

For her, at least, the role of computers in the election is not necessarily good. Nor is it yet over, as she intends to publish a detailed report on the subject. In the meantime, she is offering three prizes – to the people who can think up the most, the most efficient, and the most ingenious ways to alter the vote in a computer operation.

But not everyone was unhappy. Riverside, Calif., County Clerk Donald Sullivan said, "The new Cubic Votronics System [which the county used to count the votes] was without a doubt 100% free of human error." The Cubic machines read the ballots and transmitted the data to a translator which fed the data to a 360/40 for compilation.

Software to Control Flood Gates of Dams

LONG BEACH, Calif. – A subcontract from Progress Electronics Co., Portland, Ore., has been awarded to Control Technology, Inc. to develop software for computer control of locks and flood gates and data processing functions at dams on the Snake River in Washington State.

The dams, known as the Lower Monumental and Little Goose facilities, are part of a hydroelectric power generating project. The programming will link digital data collection systems at each of the dams to monitor water level and temperature, open and close spillway gates, and control other water flow functions.

IBM Chairman Apologizes For Attack on Brandon

NEW YORK – Thomas J. Watson, Jr., IBM board chairman, has apologized to Dick Brandon for the remarks made by Dave Mayer of IBM about the Brandon aptitude test during the recent Share/Guide meeting. Watson pointed out that Mayer did not know enough about the test to pass judgment, but that he did so anyhow. He also said that Mayer denied that he used the expression "moneygrubber" to describe Brandon, as was reported in *Computerworld*.

Another Attack

In a reply, Dick Brandon pointed out that Mayer had continued to attack Brandon Applied Systems after the Share/Guide meeting. He said that in an ACM conference on Nov. 7, Mayer had made "several negative statements about our company in front of witnesses." Apparently, at the time, he was talking to a Brandon employee, although whether he was aware of this is not clear. Brandon indicated that he therefore could not let the matter drop.

Test Not Profitable

Brandon told *Computerworld* that far from the test being a money making venture, it had yet to break even. "We felt publishing it was worth it from a promotional and altruistic viewpoint, and continued to feel this way," he said. He also pointed out that the reason why Brandon Applied Systems was not entitled to attend the Share/Guide meeting was simply because it did not have an IBM 360/40 or equivalent system, a requirement for entry to the society. "Unfortunately, not everyones knows that the rules do not relate to ethics," he said.

Brandon Test

The Brandon test was introduced in December, 1967 and was developed by Professor Wolfe of Brooklyn College. It is designed to test an applicant's ability to:

- Draw deductions with the aid of some simple calculations.
- Understand the explanation of a fairly complicated instruction of the type given in programming reference manuals.
- Understand a rather complicated statement, written succinctly and precisely without further illustration.
- Reason with symbols in accordance with specific definitions.

CDC Sees Reliability as Major Problem

MINNEAPOLIS, Minn. – William C. Norris, president of Control Data Corp., puts reliability and availability of computers as a problem area second only to the lack of skilled people.

In a speech here to the Twin Cities Society of Financial Analysts, he commented that with the advent of time sharing, equipment must be much more reliable and have a higher availability to the user. This, he said, means that the initial design has to provide for longer component life and that any breakdowns that occur must be easier to find and faster to repair.

Competitive Comparison

To achieve these goals would require both greater cost and time in product development and greater skills in computer operation and maintenance. Norris told the analysts that Control Data had paid great attention to such mundane matters as cooling, power supply design, and mechanical layout as a major requirement in achieving reliability. "We note," he said, "that many of our competitors have not provided this type of attention to the problem and, as a consequence, are suffering lack of reliability."

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Editorials

A Missing Step

Recently there has been considerable discussion on the problems of computer reliability. In these discussions, mainly brought about by computer manufacturers, the question has been raised: "How much are users prepared to pay for reliability?"

That there is a reliability problem in computers is undeniable. The third generation systems require more maintenance than had been expected, and the amount of downtime on some systems has been staggering. It is clear, therefore, that reliability must be improved. *However, it does not follow that users should have to pay for it.*

It appears to *Computerworld* that the manufacturer should take a very close look at his technique of design and redesign. It has never been clear to *Computerworld* why the current fantastic volume of engineering changes which flows from manufacturers is necessary. Indeed, it suggests that our computers are only half designed when delivered! Is it impossible to design a computer which will work with just simple maintenance?

Cannot maintenance procedures be better designed? The current crop of computers and their diagnostics are as confusing to many maintenance engineers as they are to programmers. This is not lack of knowledge – but simply a matter of bad communications which leads to unnecessary costs. A new approach in this area also would help.

These problems are in the hands of the manufacturer – not the user. We feel that manufacturers should show clearly that they have done all in their power to alleviate the situation, before jumping to the conclusion that users must pay for the necessary improvements in reliability.

The Rights of Third Parties

One area to which some of our industry groups should pay a little more attention is the rights of third parties. A number of groups have closed meetings and publish, without very much editing, much material which goes only to a restricted readership. This opens the possibility that statements may be made at these meetings and in these publications which defame people who do not even have access to the knowledge that such defamation has occurred. The recent attack on Brandon Associates at the Share/Guide meeting is a case in point. There are other such cases known to this newspaper.

We suggest that all people involved in closed meetings or in restricted publications review their rules to insure that the rights of third parties are not infringed upon, and that, where infringements already have occurred, they offer the injured parties an adequate opportunity to reply.

'HAPPY THANKSGIVING'

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Viewpoint

The Time is Now for Development Of Computer Assisted Learning

By Bernard J. Luskin
CW Contributing Editor

In this viewpoint article, Dean Luskin makes an interesting distinction between "computer assisted instruction" (CAI) and "computer assisted learning" (CAL).

CAI implies that the computer is a teacher. CAL implies that the computer is simply a tool which the student uses to help him learn.

Like Vice President Humphrey [CW, Nov. 13], Luskin foresees the development of multimedia interactive networks. Humphrey described these as "networks of knowledge."

A noted authority, Prof. B.F. Skinner, has been quoted in *Computerworld* and in *Forbes* to the effect that a "simple programmed workbook will do what the computer can do at one-tenth the cost," and "the computer *forces* one into a multiple choice format."

Actually, from a pedagogical point of view, the computer as an assistant in the learning process is very promising. Computer assisted learning (CAL) represents a new area with tremendous potential in the development of improved instructional techniques. However, it is not yet well understood. The continued development of improved software will have a direct effect on instructional methodology in many areas.

The above, or what Skinner said earlier, is, at this point, supposition. One must recognize at this juncture that the computer at once is one of the most maligned and praised developments in this century and, with all of its accelerating growth, it is still in the neophyte stages of development. Most of what many theorists say it can do is still conceptual. Only one thing is certain: concepts as implemented must be objectively evaluated, and statements must be made based on research, experimentation, and innovation, not simply on supposition.

The Positive View

Hypothesis is also necessary, however, and in a positive vein one could say that development of multimedia computer interactive networks and sophisticated software (not composed of only typical drill and practice activity, but made of multiple branch, multiple alternative, self-collecting, updating data banks of alternatives) would improve the individual carrel, terminal, or class interactive process. The development of simulation on the computer can allow the student interacting with the device to work through an experiment, to simulate a business situation, and to think his way through problems. These activities are far from the multiple choice limitation indicated by Skinner.

One will get little argument that bringing educational resources and expertise together to develop materials that are valuable to facilitate the learning process using machine assistance is expensive. However, the capability of the technology of today is a fact. The time has arrived for intense efforts by those who have particular expertise to develop and communicate and evaluate methods and techniques of CAL. The contribution that can be made toward improving educational programs through the application of modern computer technology is significant, and we must explore its potential. For the first time in the history of the world, the ability of the devices that man has developed has, at least temporarily, outstripped the uses he has developed for them.

Beyond Multiple Choice

In terms of the learning process, if we can learn to: (1) control the sequence and pace of materials both individually and on a class basis; (2) facilitate the movement of students through course work; (3) minimize redundant activity and dull drill based on evaluation of mastery; (4) provide the opportunity for tutorial instruction; (5) free teachers to do more individual work with students; (6) independently control a student's progress based on analysis of responses; (7) provide an oppoftunity for disadvantaged students in remediation or practice or drill; (8) facilitate the learning process by making it more systematic or planned; (9) provide monitoring and feedback to a student of his progress; (10) reinforce positive behavior and correct erroneous response; (11) develop simulation to the point where the student can involve himself, possibly working with others, in simulated real life situations; (12) develop simulation to the extent where time periods are telescoped down so that practical and emotional experience can be accelerated; and (13) continually collect and provide the student with information about his progress, we will certainly have taken giant strides. Even if only some of the above items prove effective, significant progress will have been made.

The components which will cause CAL to contribute constructively to the educational process are (1) the hardware, (2) the software, and (3) the personnel. Appropriate investment must now be made in each to the long-range benefit of the educational process.

The author is associate dean, federal products, and associate director, vocational education, for the Orange Coast Junior College District, Costa Mesa, Calif.

Letters to the Editor

PL/I Standardization

To the Editor:

The editorial, "Let's Check on Progress" [CW, Oct. 23], was right in the bullseye. I think, however, you dismissed the problem with too simple, albeit, reasonable, a suggestion.

It is the desire of all thinking people to have their objections considered carefully before a decision is made. There are examples of other activities to which objections have been carefully and specifically documented (to wit, the war in Vietnam). But to what purpose? I feel certain that *Computerworld* is not that naive to believe that what they are bucking is just a set of independent objections and not the system. Unlike the political system in which there is theoretical recourse, we seem to be trapped in a closed environment from which there is no appeal.

Notwithstanding, I submit my objections opposing the present establishment of a PL/I standardization effort. These objections take the form of the following questions:

1. Who are the users? To what extent are they using the language? For what applications is it being used?
2. Who are the implementors? Of what are they implementors?
3. What are the language differences with respect to Cobol and Fortran?
4. What are the languages' advantages? Namely, what can I do in PL/I that I cannot do in the other standard languages?
5. How machine independent is PL/I?
6. What effect will the standardization of PL/I have on our existing language standards?

I believe that all of us in the community have a right to receive satisfactory answers to questions such as these. I believe that it is imperative to do so before getting committed to another long and very expensive exercise of standardization under the X.3 controlled milieu.

Howard Bromberg
San Francisco

The writer has long been active in standardization efforts. Ed.

Flowcharting Problem

To the Editor:

We at CBS International are in the process of documenting several large applications that are running on our IBM 7070 and 1401 computer systems. These applications are over six years old and have been modified a great deal over the years. However, our program documentation has not been kept up to date.

We are looking for a utility program which will accept as input a 7070 Autocoder source deck and produce an up to date program flowchart. This program should be capable of recognizing

(Continued on Page 5)

How One User Matches Languages to Applications

In the past three issues, Computerworld *has discussed the Rubey Report and its comparative evaluation of PL/I, Cobol, Fortran, and Jovial.*

In the article below, a Computerworld *staff writer describes his experience in a large, commercial multiprocessing installation. He shows how the people decide which language to use for a particular job: PL/I, Cobol, or Adpac (a proprietary language marketed by Applied Data Systems).*

The choice of a particular language can make all the difference between achieving management objectives (including costs) in either the programming or the operations area, or both. Naturally, therefore, the choice is made with considerable care.

Hardware at this installation includes a large IBM 360 running under the Operating System.

First Consideration

When a new job comes in, our first reaction is to think out what the program must do. Is it a file updating job? A record searching job? One with employees' exception reporting? Or, one which produces a great deal of output? This predefinition of the program is our key study.

The decision of which language to use is normally taken after a predefinition of the function of the program. Typically, a commercial job can be a file update, or perhaps a record search. It may require only exception reporting, or it may require printed output on every record.

Adpac

In our opinion, the strength of Adpac lies in file updating operations. For jobs which add to files, or delete from them, jobs which ask for selective reporting of file contents, Adpac is much preferred to either PL/I or Cobol, even though it is recognized that such operations can be handled in any of the three languages. The reason for our preference is primarily based on economies in programming time. Adpac uses predefined logic, known as Ad-Flow, which does all the work for the programmer once he has defined his record layout and the logic for deciding just when to perform which of the various Adpac functions.

When these have been defined, Adpac will read records, analyze them, and present them to the appropriate processing routines. The use of the predebugged processing routines (which are generated during compilation) shortens debugging, and the automatic matching of the required machines to the right records greatly saves programmer time.

Neither Cobol nor PL/I, which require users to write their procedures in full, can match Adpac in this manner.

The first rule in the installation is, therefore, if it is a file processing routine, use Adpac rather than Cobol or PL/I. Incidentally, Adpac possesses the shortest compilation times we have ever been exposed to on the System 360. It also has the most efficient macro language code generated by any compiler.

Cobol

However, we find that sometimes more sophisticated programs are necessary. These may involve intermediate sorting, complex reports, teleprocessing. They may require some ease of adaptation between different machines. Perhaps Cobol will provide the answers. Cobol has many advantages over PL/I simply because more people know the language. It provides sort capabilities which are easier to use than the sort utilities and permits programs to be developed so as to minimize duplications of effort.

Our experience is that it does require more coding time than Adpac, and more debugging time. For new programs it takes longer to learn than Adpac. It also lacks the extreme flexibility of PL/I.

The object code generated has been reasonably efficient. It has built-in documentation superior to those of either PL/I or Adpac.

For these reasons, the second rule is that if Adpac is either incapable (remember it is a problem language) or not available for the machine, then Cobol is our choice.

PL/I

PL/I is the preferred language in many cases, however. It has several advantages. One is its extreme flexibility in the large scale environment. It adapts very well to on-line applications due to its ability to handle regional data sets (i.e., those used in a specific processing period and then freed). It provides tools to do almost anything imaginable, and these are set up in ways that make it unnecessary to know about them unless you really need them. In a commercial environment it allows us to have full scientific facilities available. File searching and decision logic is improved through the ability to handle strings, which is sadly lacking in Cobol and Adpac. It also provides the most comprehensive input/output language of any of the languages with which we are familiar. Our experience is that it tends to be fairly simple to debug, somewhere between Cobol and Adpac.

However, a price is paid for these features and we often find that the price is too high. It costs too much money to use a language that compiles slowly, generates inefficient object core usage, and hasn't been sufficiently refined yet to permit the user to take advantage of most of the optimization features designed into the language. Temporarily, therefore, we use PL/I only where its particular facilities and flexibility are needed in the program. Where possible, we use one of the other languages.

Summary

In general, we attempt to use Adpac wherever possible because it is cheaper (you can lease it for less than the salary of one programmer and it pays off very well) and faster. Where Adpac cannot meet the need, then Cobol is probably the best choice for the moment. Currently we stay away from PL/I unless we are dealing with a very sophisticated system and wish to maintain it in one language.

We recommend you use your available resources wisely. Do not feel too bound to the concept of mono-language systems. Mixing languages can save you as much money in the long run as in the short run.

Other installations which also face the problem of selecting between languages are invited to tell Computerworld *how they go about it.*

	Adpac	Cobol	PL/I
When to use	File maintenance Reports Summaries Data generation	Machine compatibility desired Other user Adpac n/a on machine Indexed sequential file handling	Real time Sophisticated data manipulation Complex math Complex internal logic Extensive file usage
Why	Faster, simpler, more efficient Built-in sequential file processing	IBM machines only for Adpac & PL/I Generally better known Better indexed sequential file-handling	Very adaptable for subroutining (i.e., procedure orientation) String ability Floating point and math support excellent Highly flexible execution control
When not to use	Complex math Real time (except subroutines) Indexed sequential files	When Adpac available For sophisticated data manipulation Use of binary fields	Core critical Learning time important Machine compatibility
Why	No floating point Awkward with indexed sequential files	Rather inflexible I/O (structures only) Very inefficient binary handling	High core overhead Generally unknown: needs more time to learn Available only from IBM at present

Basic guide used to select language when Cobol, PL/I, and Adpac were available for business oriented, large-scale systems.

Letters to the Editor

(Continued from Page 4)

and analyzing the IBM-supplied macro statements (e.g., Get, Put, Arith, Move, etc.) and carrying over to the flowchart any commentary that appears in the source statements.

We would greatly appreciate any information you could give us as to the availability of such a program, and the names of companies or individuals we could contact to obtain further information.

Nicholas Kanelos
CBS International
New York

Anyone able to help CBS? Ed.

Cobol vs. BAL

To the Editor:

Our firm is currently interested in any comparison studies which may have been made regarding Cobol and any assembly language, particularly BAL, on the 360 series. If *Computerworld* happens to have any such information on file, we would be most appreciative of receiving same.

Marcia D. Mobley
Advanced Computer Techniques
Atlanta

A good local source would be Codasyl chairman John L. Jones at Southern Railways Systems, 125 Spring St., S.W., Atlanta. Ed.

Standard Cobol

To the Editor:

In your Sept. 18 issue, you had an article regarding the new U.S.A. Standard Cobol. Can you tell me where to obtain further information in regard to this standard?

Mrs. K.J. Stejskal
Corporate Secretary
National Data Processing Corp.
Cedar Rapids, Iowa

Currently there is no published information. It will be available via A. Groves, Data Processing Group, Business Equipment Manufacturers Association, 235 E. 42nd St., New York, early next year. Ed.

2314 Replacements

To the Editor:

As I recall, in previous issues of *Computerworld* you announced equipment compatible with the IBM 2314 which is available as a single or double unit rather than the eight drive unit. Since we only need four or five units instead of eight units, I would appreciate the names of the suppliers who produce these units.

David H. Thornton
Programming Manager
Dept. of Administration
State of N. Carolina
Raleigh, N.C.

Contact Memorex Corp., Santa Clara, Calif. 95050. Ed.

Software Costs

To the Editor:

While the Guide and Share meetings keep worrying about the support or lack of support of IBM programs and software, IBM has the ability to continue to deliver software which increases its rental from the customer at the rate of 20% per year. It is interesting to hear the cry of the Indians while the IBM Company is being completely satisfied by obtaining greater and increased revenues through its software which can only operate on bigger and expanded computer systems.

This is the subject that the Guide and Share users should address. The reason they probably do not consider this the problem is that they are not profit oriented.

George S. McLaughlin, Jr.
George S. McLaughlin Assoc.
Summit, N.J.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 60 Austin St., Newton, Mass. 02160.

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Ronald L. Woodall	Senior Systems Analyst Information Services	Univac Cleveland	Operations Branch Chief	Supply Systems Management Air Force

J.J. Kimbark

G.L. Bergstrom

H.F. Collins

R.M. Abisch

N.C. Young

R.L. Woodall

orders and installations

The U.S. Navy has ordered two Control Data 3300 computers and eight 915 page readers to be used in implementation of the Joint Uniform Military Pay System being instituted by the armed forces.

The New England Electric System has ordered its first components of System G from Photon, Inc., Wilmington, Mass. The unit will be used in the production of electrical system schematics and semi-geographic diagrams.

Compuscan, Leonia, N.J., a data analysis service bureau, recently installed an SDS Sigma 2 computer system to analyze electrocardiograms, infrared spectra, seismic record sections, weather maps, and other graphically recorded data.

The French Institute of Petroleum, located near Paris, has installed a Control Data 6400 computer for use in simulation of data on oil reservoirs, refinery processing, and geophysical research.

Latham Process Corp., New York, a commercial lithographer

and printer, has installed a magnetic tape driven Photon Zip 901 computerized phototypesetting system.

The City of Danbury, Conn., has ordered a Univac 9200 computer system to be used for civic business operations, the police department, and the school system.

Peterson, Howell & Heather, Inc., Baltimore, has ordered a $1.3 million multi-unit Honeywell computer system to expand its service in managing more than 125,000 automobiles, trucks, and airplanes under its management or leasing plans.

The New England Telephone Co. has ordered its 10th commercial data communications terminal system from Stelma, Inc., Stamford, Conn., for installation on the Key-Data Corp. time sharing computer system. The system provides for 189 low speed data channels and is expandable in steps of 27 channels as customers are added to the network.

The First National Bank of Allentown, Pa., has ordered an NCR Century 200 computer system for a central information file program. The new system replaces an NCR 310 computer.

The Green Point Savings Bank, Brooklyn, N.Y., has ordered two NCR 315 time sharing computer systems for on-line processing of customer transactions.

Strand Hotels, Ltd., London, has ordered a Digital Equipment Corp. PDP-8/I computer system for financial and management acccunting, stock and cost control for restaurant and catering services, invoicing of hotel and credit business, and processing data on sales and purchases.

Framingham Trust Co., Framingham, Mass., has installed a Honeywell 125 computer system with cathode ray tube devices and audio response units at teller stations. Tellers will be able to use regular telephone lines and audio-response for simple inquiries.

Hospital to Use Lockheed Service For Business DP

SUNNYVALE, Calif. – Ross General Hospital, Ross, has selected Lockheed Missiles & Space Co. to provide a business office service. Information on business office operations at the hospital will be sent to the computer center for data processing. The center will return reports on the hospital financial activities, including the preparation of Medicare bills.

Blood Center Contract Let

MILWAUKEE, Wis. – The Milwaukee Blood Center, Inc., has awarded a subcontract to International Computing Co., Bethes-

CONTRACTS

da, Md., to develop, install, and operate a prototype on-line blood inventory control system for automating the management of central blood banks. Results from the investigations will be used to design a production model for an automated blood banking system. The system is being sponsored by the National Heart Institute and is scheduled to be operating in January.

Planning Research Selected

LOS ANGELES – RCA has selected Planning Research Corp. to design and develop cost and system evaluation approaches for the U.S. Army's Mallard Project. The system will be a fully automated, secured, digital communications system applicable to all theaters of operation and types of warfare, and is to be compatible with the military communications systems of the Navy and Air Force.

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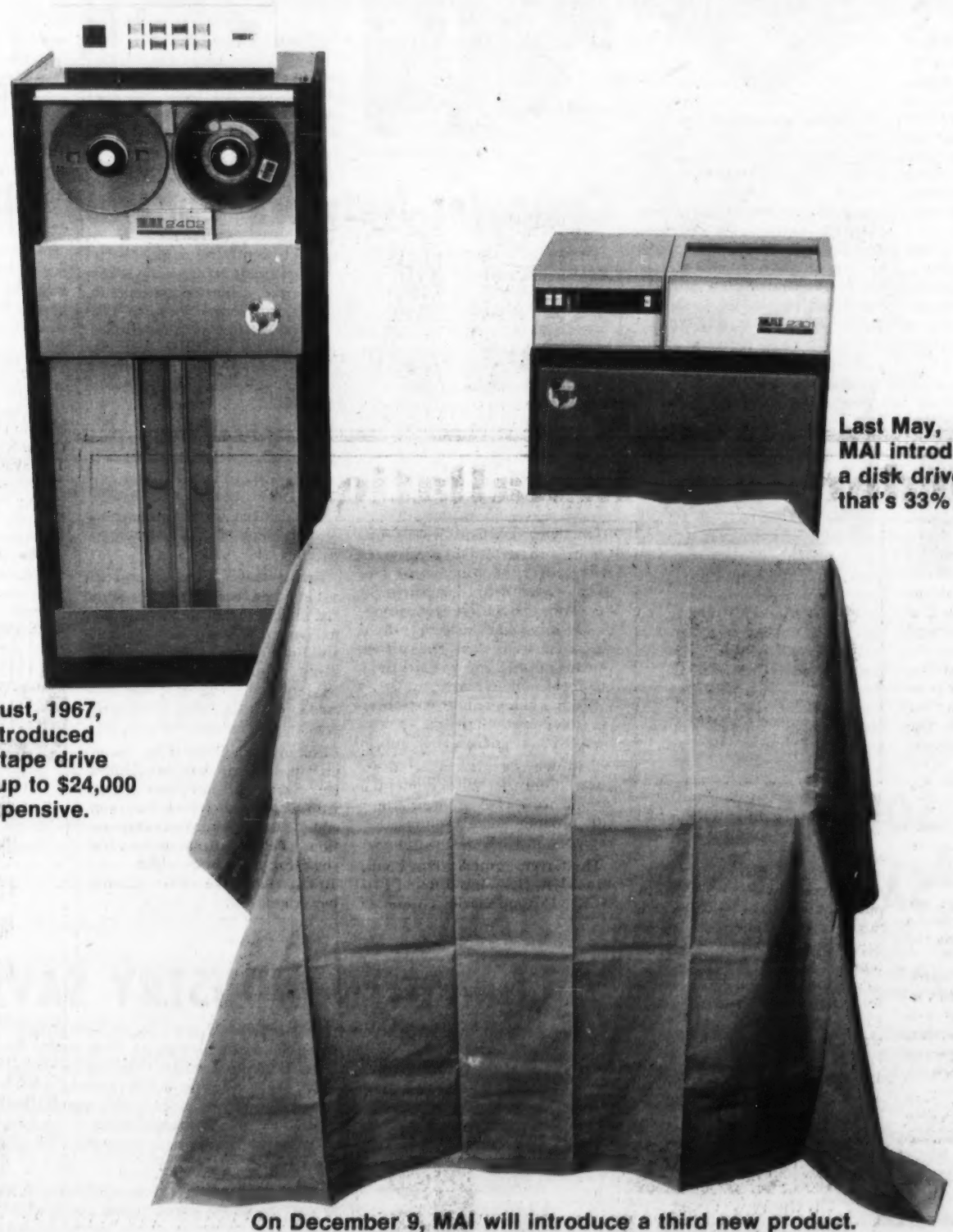
CPM Being Used to Reduce Office Renovation Problems

WASHINGTON, D.C. – A three year renovation project at the Department of Commerce Building will be carried out without disturbing the department's activities – if all goes as planned.

Mauchly Associates, Inc., retained by Washington architects Hudgins, Thomson, Ball & Associates as planning and scheduling consultants, is using the Critical Path Method (CPM) to create a computer derived construction schedule and information system to allow the department to function normally. The project includes installing an air conditioning system for the entire building and rearranging most of the offices with regard to partitions and interior decor.

Mauchly already has begun work on a preliminary phasing plan which will compile all agency and renovation activities into a network with time estimates for each activity. Using the network as a guide, the consultant will then develop a working CPM plan, which will allow the work to proceed without interfering with the current operations and functions of the occupying agency.

The final phase will consist of assisting the architects in scheduling the vacating of present work areas and relocation upon completion of the renovation work. This operation must be planned to provide minimum interference with current operations at minimum cost.



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Display Handles Characters, Drawings

(Continued from Page 1)

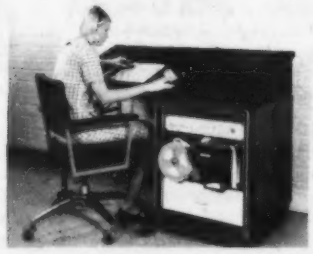
screen to be erased, and the programmer must provide a wait loop while this is taking place. Unlike hard copy outputs, the programmer must also remember to leave the message on the screen for a minimum period of time, long enough for the operator to read it. This is an annoyance, because most third generation systems will not permit the user to control the system for that long a period of time, and this could be even more significant in a time sharing environment. The unit has a strong compensatory feature, however. The long image retention time (15 minutes) permits much greater freedom in the control of the device. The company currently does not intend replacing the unit simply to overcome the half-second erase delay.

The display size is 6-1/2" x 8-1/4" and can hold up to 4000 characters. The character set includes the complete 94 character ASCII set. Writing speed is about 100 cps over a normal telephone line, and 400 cps over a wideband link.

The vector capability is single line operation with increments up to 1023 over 6". Each specific command handles one straight line.

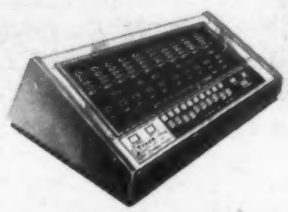
New Products

Digitizer



A new input system for off-line digitizing of graphic material or film images can be used as a keypunch for encoding selected items for inventory control or management information systems. The $9500 Model 303 consists of a Model 88Z Datacoder with a 12.6" by 10.5" operating surface, a papertape perforator, operating keyboard, and associated electronics. Delivery is 90-120 days after receipt of order. Bolt Beranek and Newman, Inc., 2126 S. Lyon St., Santa Ana, Calif. 92705.

Logic Trainer



A digital logic trainer has been developed to teach logic design in the classroom. The Logi-Tran Four enables students to explore digital logic functions by a hands-on interconnection of logic elements. Options for the $645 unit include specialty modules and a standard relay rack mounting for expanded class projects. Fabri-Tek Inc., 5901 S. County Rd. 18, Edina, Minn. 55435.

Desk-Top Computer

A new 10 volt desk-top computer is an analog machine with expandable control logic for hybrid interface. In its basic analog configuration it is suited to undergraduate instruction. In expanded format the model 380 can be used to teach advanced students, or in the research and development laboratory. Electronic Associates, Inc., West Long Branch, N.J.

Image Control Paper

A new paper has been developed for high speed reproduction equipment and is reported to be particularly suitable for use in the data processing and photo composition field, as well as for microfilm reduction. The paper is available in weights of 15, 20, and 33 pounds, preprinted if desired, and in cut sheets or continuous form. Columbia Ribbon & Carbon Mfg. Co., Glen Cove, N.Y.

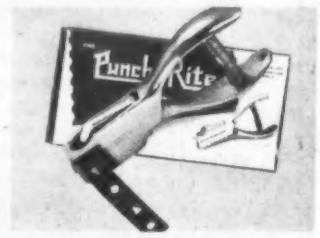
Desk-Top File

A new two drawer desk file is available in both standard microfiche and aperture card sizes. The Snap-Loc has a front compressor plate to hold the file open at a "V" angle to the point of reference. Units may be stacked and interlocked. Mead Hatcher Associates, 1721 Elmwood Ave., Buffalo, N.Y. 14207.

Forms Guide

A new forms guide and stacker may be used with any printer or office typewriter using continuous forms. The stacking trays and the feed height are adjustable. The Algaliner is portable and requires no tools for installation. Periphery, Inc., 65 Nicholas Rd., Framingham, Mass. 01701.

Hand Punch



A new hand punch has been designed for punching mylar tape. The 5R-T Punch-Rite has a fixed reach to position the punching apparatus in the center of 1/2" wide mylar tape. The $16 model punches a 1/4" triangular opening and the $14 model a 3/16" circular hole. A receptacle for catching punchouts or clippings is included. P.J. Mieth Mfg. Co., 2130 Bridge Ave., Point Pleasant, N.J. 08742.

Computer Network Controls Oil Pipeline

EDMONTON, Alberta, Canada – A complex of 24 PDP-8/S computers and an IBM 360/40 is being used to control the flow of 200 million barrels a year of crude oil through a huge pipeline between Canada and the United States. The computerized system is operated by Interprovincial Pipe Line Co. and its subsidiary, Lakehead Pipe Line Co., Superior, Wis.

All 32 pumping stations along an 1100 mile segment (Edmonton to Superior) of the 2000 mile line have been placed under the control of 20 Digital Equipment Corp. PDP-8/S computers. Two additional 8/S computers in Superior and Sarnia, Ontario, are used for data acquisition from 30 more pumping stations along the balance of the line which extends to Port Credit, Ontario.

Each of these remote computers is connected on-line to two more 8/S systems and an IBM 360/40 in the central computer complex at the Edmonton headquarters of Interprovincial.

Three Years' Planning

The automation project, undertaken three years ago, was designed to centralize control without sacrificing safety and, at the same time, achieve economies in operation. Formerly some sections of the line were monitored by banks of fixed display, hardwired devices which required an operator to control and to interpret and transmit data to a central information center.

Interprovincial established basic criteria for the new system, the most important being that it must "offer the maximum amount of speed and flexibility and must be at least as flexible as the pipeline itself."

The computer approach was decided upon because the "potential savings, particularly in future expansion, were found to be substantial" when compared to the fixed display system. D.C.F. Systems Ltd., Toronto, was commissioned to conduct feasibility studies and to assist in programming the PDP computers.

Each computer must handle three separate pipelines through each pumping location, three separate pumping stations at each location, and up to a total of 13 pumping units per location.

The computers scan the pumping locations on a continuous basis and transmit to the central system such information as suction pressures, discharge pressures, case and holding pressures (where applicable), station electrical load, gravitometer and interface detector readings, and tank gauges (where practical).

In addition to scanning the locations, the remote computers compare all readings to those last reported to the central control and, if they are beyond predefined limits, or if there has been a change in contact sense, they originate a transmission of the discrepancies.

These computers start and stop main pumping units, one at a time, on command from the central computer, open and close main breakers on command, sound alarms automatically, and change predefined limits for reporting functions, on command, among other capabilities.

Hospital Articles Delayed

Part II of the hospital series will be delayed, to allow us to include material which developed as a result of last week's articles.

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System 'Restores' Distorted Photos

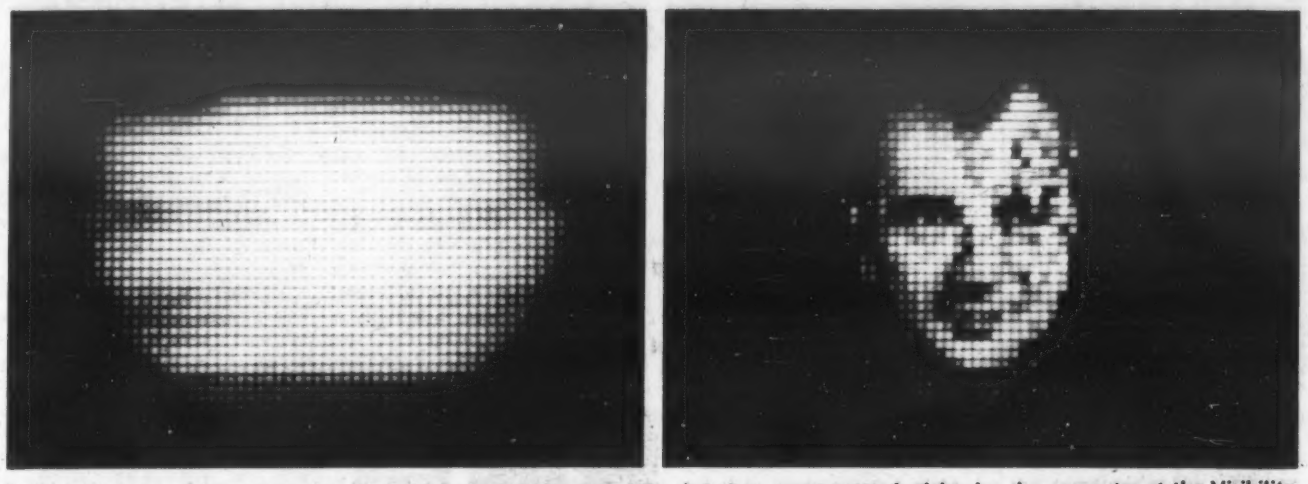
SAN DIEGO, Calif. – A dialog between a computer and a scientist is helping space researchers get clearer pictures from photographs blighted by distortion, blur, and exposure error.

The research, being done at Scripps Institution of Oceanography's Visibility Laboratory, involves such difficult areas as celestial photography, where distortion by the earth's atmosphere must be overcome, and microscope and X-ray photography, where subtleties recorded on the film often are not discernible to the human eye.

This improvement in picture quality could lead to important advances in medicine, X-ray technology, and space science.

"Instead of turning a problem over to the computer and telling the machine which procedure to take, we keep a scientist involved in the photo correction process," explained James L. Harris, who directs the research group.

"Although the computer can complete an entire operation on its own," he said, "in our system the experimenter can modify a procedure while it's in progress. He can converse with the computer through a typewriter keyboard in noncomputer language."



A blurred photo of a man moving his head is first segmented, left, and then reconstructed, right, by the computer at the Visibility Laboratory of the Scripps Institution of Oceanography.

The programming that accomplishes this conversational approach was developed by I.H. Barkdoll and M.L. Myers of the Visibility Laboratory.

Researchers are just beginning to see the benefits of this man-plus-computer concept in photo enhancement, according to Dr. S.Q. Duntley, director of the laboratory.

Atmospheric Distortion

A current project – in cooperation with the California Institute of Technology – is the removal of distortion from photos of the planet Mercury, a problem that has frustrated celestial photographers for generations.

Because of its nearness to the sun's light path, Mercury must be photographed just before sunrise or just after sunset, when the perimeter of the earth blocks the sun's direct rays. But the routes of such photos slant across the earth's atmosphere from the horizon, and the atmosphere causes severe distortion. A Visibility Laboratory team headed by B.L. McGlamery is using the computer to reduce the distortion.

Similarly, efforts are being made to clear up microscope pictures.

"Medical men say great strides could be made in conquering diseases if they could see 'just a little bit more' through the microscope," Harris said.

"For instance, even under a perfect microscope, a point of light is diffracted and creates a circular pattern. We can program the computer to eliminate much of the diffraction and reduce that pattern of light to a pinpoint."

Motion Distortion

Another set of instructions directs the computer to eliminate blur caused by camera or subject motion. Still another produces detail in areas, such as deep shadows, that appear solid black in normal photographs. This process also can heighten the readability of X-rays.

"Film recognizes many gradations of gray that the human eye simply can't see," Harris said. "We're allowing the computer to serve as the intermediary between this sensitive film and man's insensitive eyes."

Basically, the photo restoration process works like this:

A machine scans the picture and converts it into dots (more than 4000 dots per image). At the same time each dot is appraised by the scanner and assigned a number value – from one to 10,000 – corresponding to its shade of gray. This information can be sent directly to the computer without the intermediate step of punched cards or magnetic tape.

Then the experimenter tells the IBM 1800 what went wrong with the photography.

If the picture is out of focus, for instance, the computer is told that each point in the picture has become a tiny circle and is instructed to turn the circles back to points.

All the while the scientist is interacting with the system, revising and adjusting the process as it runs its course.

Even if a picture is so underexposed as to appear solid black, the scanner can detect slight differences as it assesses each dot. Then, when the computer is told to increase the contrast of these dots and illustrate the results, an image appears on a CRT. A camera films this revised image off the tube.

"We can't yet duplicate the human physiological system or fully understand man's capabilities," Harris concluded, "so we've built him into our system."

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Model of River Assists In Conservation Planning

Special to Computerworld

PORTLAND, Ore. – A computer has created a working model of the Columbia River that simulates the waterway's entire 1214 mile course from the Canadian Rockies to the sea.

From this mainstream in miniature, U.S. Army engineers calculate where and what kinds of dams should be built, when destructive floods are due, and what the area's power and water needs will be in the years ahead.

The computer monitors the river and its tributaries from 100 stations in British Columbia, Washington, Oregon, Idaho, Montana, and Wyoming. This data forms the basis for the mathematical model, which has proved more than 90% accurate when its forecasts are later compared with actual measurements of the Columbia.

"When we finish the water control projects now under way – in 1973 – we'll be able to guarantee that the Columbia River Basin would survive a flood equal to the worst ever recorded here – in 1894 – without major damage or loss," said Mark Nelson, chief of the reservoir control center of the Corps of Engineers' North Pacific Division.

Before the computer era, river forecasters could look ahead only three or four days with accuracy. Now they can predict what the river will be doing 45 days in advance.

The intricate system of dams also means more irrigation water to farmers throughout the Northwest and ample supplies of drinking water during the dry summer months, as well as increased power supplies during the fall and winter.

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New Software Handles Conversational Displays

Special to Computerworld

LOS ANGELES — A new type of software, aimed at assisting programmers and analysts in writing display packages for the System 360, is being offered at $9500 by Informatics. Called Displayall, it allows generation and verification of display images and provides the capability to handle multiple operating structures and multiple terminals. It operates as a single job within the multiprogramming capabilities of OS/360.

The idea of the software is to reduce both the programming and development burdens and the development time required for applications using CRT terminals.

Not Application Oriented

Primarily, the purpose of Displayall is to provide the analyst and the programmer with a simple method of handling displays so that they can concentrate on the application itself.

These application programs normally involve dialog and conversational display. A library is provided for displays and for automatic processing of dialogs. Informatics believes that a simple information retrieval system could be completely written in Displayall, but it feels this would be exceptional. In general the firm feels that most users will need to program the specific application functions.

The library is expandable so that a customer can add application oriented programs developed by his programmers for the Displayall system. Memory allocation, which involves a trade off between faster execution and using less memory, is left under the control of the user.

Fortran IV, BAL

The current existing on-line programs under OS/360 can be operated under Displayall, according to Informatics, and the new programs in Fortran IV and assembler languages can be used.

Particular areas of application include file maintenance, information retrieval, computer assisted instruction, and data entry.

Canadian Taxes Added to Alltax As $200 Module

STONY POINT, N.Y. — For $200, users of Alltax Cobol software package can add Canadian tax calculations. The package, marketed by Management Information Service, already calculates U.S. federal, state, city, and county withholding taxes.

Canadian calculations are activated by a special State-Code so that the linkage for Canadian purposes is identical to American linkage.

Calculations are provided for Canadian provincial, Manitoba/Saskatchewan provincial, Canadian federal, Quebec provincial, Canadian unemployment and Canadian pension plan taxes.

'Wholesale Impact' Now Available for the 360/20

WHITE PLAINS, N.Y. — IBM's Wholesale Impact program, designed to help distribution industries manage their inventories, is now available for the 360/20.

Wholesale Impact (Inventory Management Program and Control Techniques) provides information needed to maintain economic levels of warehouse inventories.

The program can be used to forecast future demands for inventory items, measure and adjust to changing demands, indicate when and how much to purchase, and ensure that quantity discounts and most economic freight rates are realized.

Previously the program could be used only on larger System/360 models.

Computer Letter Writing System Personalizes 2000 Letters/Hour

LANHAM, Md. — A computer letter system, written for the 360/30 and the 360/40 and consisting of two computer programs, is designed to produce personalized letters in upper and lower case at a rate of over 2000 per hour. Personalized variable length information may be included anywhere in the body of each letter.

In addition, the system permits full hyphenation, automatic line justification, and table lookup features which reduce keypunching.

Softpak, Inc. is selling the package for $450.

A complete file maintenance system also is available.

Bookkeeping System Is Developed

Special to Computerworld

LOS ANGELES — Bailey Automation, Inc. has developed what it describes as an automated bookkeeping system for life insurance agencies.

Using a departmental accounting approach, the system enables a life insurance agency to prepare accurate income and expense analyses, operational budgets and forecasts, and to determine new business and renewal business costs, in addition to handling the day to day bookkeeping chores, Bailey said.

The system will soon be able to accumulate withholding tax data for preparing tax returns and year end statements automatically.

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COMPUTERWORLD

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UCC May Spin Off School To Staff, Stockholders

DALLAS – University Computing Co. is considering spinning off its education division to employees and stockholders next year.

The division, which consists of the Academy of Computer Technology, would be partially sold to a group of investors, including some academy officers and employees, with the remainder distributed to UCC stockholders, the firm said.

A tentative plan is expected in December, with the distribution to take place after legal and regulatory requirements are satisfied and after the "expected combination" of UCC and Gulf Insurance Co.

Esterline to Buy 25% of Astrodata

NEW YORK – Esterline Corp., a data sensing and recording company, has agreed in principle to buy $5 million in previously authorized Astrodata Inc. preferred stock, convertible into 500,000 common shares, and to receive warrants to purchase an additional 250,000 Astrodata common shares at $19 each.

Conversion of Astrodata preferred shares, after including all existing residual securities, will represent a 24% interest, the announcement said. The agreement is subject to approval by the boards of both companies and certain legal and regulatory requirements.

Astrodata, based in Anaheim, Calif., is a producer of data acquisition systems and other devices.

Investors Group Plans Offering

NEW YORK – Computer Investors Group Inc.'s overseas financing subsidiary has reinstated a planned, but previously postponed, $10 million European public offering of convertible debentures due in 1988. They won't be offered in North America.

Dominick & Dominick Inc., a co-manager along with Banque de Paris et des Pay-Bas of the sponsoring underwriting group, blamed the postponement on printing difficulties.

The debentures will be convertible into common shares of Computer Investors. Proceeds will be invested in a United Kingdom affiliate and a German subsidiary.

New Registrations

OMNIMEDIA, Inc., 475 Fifth Ave., New York, a producer of programs for use in audio visual communication systems, filed to register 280,000 common shares. Proceeds, at $1.80 per share, intended for equipment, working capital, and other corporate purposes. The underwriter is Hopp & Co., Passaic, N.J.

PROGRAMMED TAX SYSTEMS, Inc., 146-14 Hillside Ave., Jamaica, N.Y., computer processor of tax returns, filed to register 200,000 common shares. Proceeds, at $5 per share, intended for working capital and other corporate purposes. The underwriter is D.H. Blair Securities Corp., 5 Hanover Sq., New York.

BUNKER-RAMO Corp., 1200 Harger Rd., Oak Brook, Ill., a manufacturer of computers, control devices, and related equipment, filed to register 133,333 common shares. Proceeds, at a maximum of $17.85 per share, for selling stockholders. The underwriter is to be named.

U.S. TIME-SHARING, Inc., 2135 Wisconsin Ave., N.W., Washington, D.C., a computer service company, filed to register $2.5 million in convertible subordinate debentures due in 1984. Proceeds, at face value, intended for equipment and other corporate purposes. The underwriters are Grim & Davis, Inc., New York, and Wachtel & Co., Inc., Washington, D.C.

CALDWELL COMPUTER CORP., 4300 North Central Expressway, Dallas, a company which will act as a lessor of computers, and as a broker for buyers and sellers of computers, has filed to register 200,000 common shares. Proceeds, at a maximum of $5 per share, intended for equipment, debt repayment, and working capital. The underwriter is Sanders & Co., Inc., Dallas.

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Failures of Proposed Mergers Rise by 98%

NEW YORK – Xerox Corp. and C.I.T. Financial Corp. have announced they are calling off what would have been one of the biggest corporate mergers ever; it would have resulted in a company with more than $1.2 billion in annual revenues. The termination notice came only little more than a month after they first disclosed they were considering a merger.

According to a tabulation by W.T. Grimm & Co., a Chicago-based firm that keeps tabs on mergers, announcements of merger failures in the first nine months of 1968 rose 98% from a year earlier.

A Nov. 15 *Wall Street Journal* article offered several reasons for this trend:

- The New York Stock Exchange, in July of this year, announced stiffer rules regarding what the Big Board companies must disclose, and when they must do it. Shortly thereafter, a federal court decision in the Texas Gulf Sulphur case led many executives to conclude they must announce immediately any developments that might have a material effect on the prices of their companies' stocks.

The result is often premature disclosure that merger talks are in progress. Bartlett F. Crawford of Williams Brothers Co. put it this way: "It's like a couple being forced to announce their engagement after the first date – before they know if they even like each other very well."

- Early disclosure may actually torpedo a merger that otherwise might have gone through. Unlike an engagement ring, "a merger announcement is the same thing as advertising the fact that a company can be had," comments J. Morton Davis, president of the New York investment banking firm of D.H. Blair & Co. Company presidents are now apt to talk to all comers, primarily due to several suits by stockholders involving charges that management passed up promising combinations. It appears difficult to keep an eternal triangle from developing.
- Many companies open merger discussions they never really intend to carry through. A company being courted may itself start courting a third company, but drop the affair when its suitor gets disinterested. What might be termed "playboy" companies have been known to make competitive bids just to create the impression of aggressiveness and thereby strengthen the price of their stock.
- A general drop in stock prices can cause a merger failure if it reduces the value of the securities a company might issue to buy out another. On the other hand, an increase in the price of the stock of the courted company may make a few weeks' old tender offer seem unappealing. Western Union stockholders were urged not to accept University Computing's bid for some of their shares for this reason.
- An investigation by a federal regulatory agency can spell doom for a merger. This may have been a factor in the Xerox-C.I.T. talks. Last month the Justice Department was looking into their proposed merger.
- In a similar vein, there appear to be growing doubts among companies that get merger offers from conglomerates about the future of these multi-industry ventures.

The relative lack of big merger failure stories in the computer industry (the Western Union-University Computing-Computer Sciences story last May-August was an exception) can be attributed to the tendency of small, non-Big Board companies to be the principals in merger talks. When larger companies are involved they tend to go after small companies that their competitors might not be interested in. The table below lists some acquisitions involving *Computerworld* listed companies which have either been proposed, completed, or failed (F) in the last half-year.

Prospective Mergers

Armco Steel—Boothe Computer
Automatic Data Processing—I.D.R.
Brandon Applied Systems—Ehlers, Maremont
Bunker-Ramo—Amphenol
Calcomp—Airform
Clary—Rushin Truss
—Accurate Electronics
Computer Applications—Arlington House
Computer Leasing—Standard Computers
Computer Sciences—City Planning
—Western Union(F)
Computing & Software—Troy Computer Products
—Tabulating Labs
—American Mailing
Control Data—Printed Circuits
—Commercial Credit Corp.
—American Business Systems
—Electronic Associates (F)
—Electronic Accounting Card
Datamation Services—W.R. Simmons
Digitek—Application Research
—Marina Research
DPA—Pioneer Texas
Electronic Memories—Midwest Circuits
Granite Equipment Leasing—Omni Computer
—American Inst. of Technology
Informatics—Computing Technology
Leasco—Reliance Insurance
—Container Transport International
—Operations Research
—Information Development
—Ibucon
Levin-Townsend—Exquisite Form
Mohawk Data Sciences—Ohr-Tronics
—H.M. Storms
Planning Research—Maynard
—J.L. Jacobs
RCA—St. Regis Paper
Software Systems—Reid & Thomas
Strategic Systems—ConData Systems
United Data Centers—Data Systems
—Electronic Processors
University Computing—American Data Processing
—Western Union (F)
—Gulf Insurance
—Hunter Associates
URS Systems—United Research
Xerox—C.I.T. Financial (F)

Earnings Reports

BRANDON APPLIED SYSTEMS

2nd Quarter Ended Aug. 31

	b1968	b1967
Revenue	$561,815	$362,288
Earnings	22,467	(24,308)
aShr Ernd	0.03	(0.04)

Six Months Ended Aug. 31

Revenue	$1,030,213	$782,867
Earnings	(19,681)	5,548
aShr Ernd	(0.03)	0.01

a—Restated to include company acquired Aug. 31, 1968, on a pooling of interests basis. b—Adjusted for a 2-for-1 stock split June 20.

GREYHOUND COMPUTER

Nine Months Ended Sept. 30

	1968	1967
Revenue	$27,963,507	$16,970,773
Earnings	4,049,412	2,867,762
Shr Ernd	0.97	0.77

MEMOREX CORPORATION

Nine Months Ended Sept. 30

	1968	1967
Revenue	$39,956,000	$23,310,000
Earnings	3,020,000	2,316,000
aShr Ernd	0.83	0.70

a—Adjusted to reflect conversion of 5% convertible subordinated debentures and 3-for-1 stock split.

DATA PRODUCTS CORP.

Six Months Ended Sept. 28

	a1968	b1967
Revenue	$13,172,156	$10,043,487
Earnings	413,007	319,251
Shr Ernd	0.10	0.09

a—Unaudited. b—Restated to reflect acquisition on a pooling of interests basis.

DATAMATION SERVICES INC.

Nine Months Ended Sept. 30

	1968	1967
Revenue	$3,024,000	$2,482,000
Earnings	233,000	105,000
Shr Ernd	0.47	0.23

INFORMATICS INC.

Six Months Ended Sept. 28

	1968	1967
Revenue	$4,531,000	$3,782,000
Earnings	175,000	181,000
Shr Ernd	0.30	0.32

NORTH ATLANTIC INDUSTRIES, INC.

Six Months Ended June 22

	1968	1967
Revenue	$2,063,000	$1,625,000
Earnings	134,832	85,332
Shr Ernd	0.33	0.21

FABRI-TEK INC.

Six Months Ended Sept. 30

	a1968	1967
Revenue	$7,921,000	$10,001,464
bEarnings	139,055	(283,394)
Shr Ernd	0.04	(0.09)

a—Reflects acquisition as a purchase. b—Reflects tax loss carryback.

RANDOLPH COMPUTER CORP.

Year Ended Sept. 30

	c1968	1967
aRevenue	$26,567,000	$12,820,000
aEarnings	3,382,000	1,373,000
bShr Ernd	1.75	1.11

a—Reflects companies acquired in 1967 and 1968 on a pooling of interests basis. b—Restated to reflect 2-for-1 stock split May 17, but does not reflect possible dilution effect of the conversion of debentures or the exercise of stock options. c—Unaudited.

DEARBORN COMPUTER CORP.

3rd Quarter Ended July 31

	1968	a1967
Revenue	$2,557,000	—
Earnings	280,000	—
Shr Ernd	0.34	—

Nine Months Ended July 31

Revenue	$4,454,000	—
Earnings	542,000	—
Shr Ernd	0.73	—

a—Comparative figures not available as the company did not begin operations until June, 1967.

DIGITEK CORP.

1st Quarter Ended Aug. 31

	1968	a1967
Revenue	$681,502	$626,171
Earnings	43,788	(74,281)
Shr Ernd	0.05	(0.09)

a—Restated.

SANDERS ASSOCIATES, INC.

Year Ended July 31

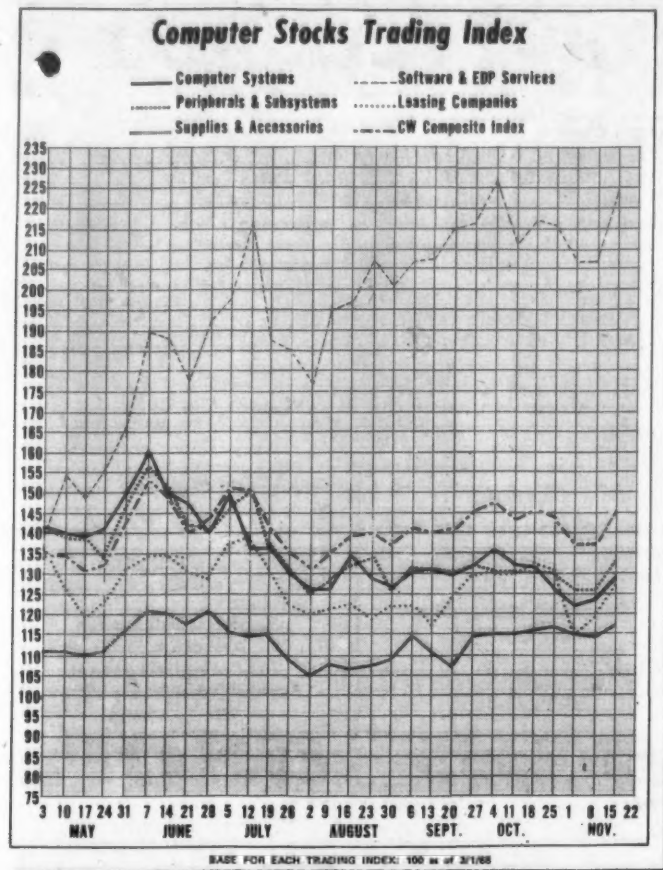
	1968	1967
Revenue	$193,300,000	$139,300,000
Earnings	6,180,000	4,710,000
Shr Ernd	1.39	1.23

SCIENTIFIC DATA SYSTEMS

Nine Months Ended Sept. 30

	a1968	b1967
Revenue	$70,754,000	$50,015,000
Earnings	6,759,000	4,662,000
Shr Ernd	1.10	0.86

a—Unaudited. b—Adjusted for a 3-for-2 stock split distributed in June.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CW Composite Index
235 230 225 220 215 210 205 200 195 190 185 180 175 170 165 160 155 150 145 140 135 130 125 120 115 110 105 100 95 90 85 80 75
3 10 17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22
MAY JUNE JULY AUGUST SEPT. OCT. NOV.

BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

Rise in EDP Stocks Best in 5 Months

The *Computerworld* composite stock average posted its biggest percentage gain in five months during the week ended Nov. 15. The average jumped 9 points (5.80%) to close at 146.

All of the major indexes were also up, but only slightly. The Dow Jones industrial average rose 6.90 (0.72%) to 965.88, still below the 1968 high of 967.49 set Oct. 18, and 3.5% under the 995.15 record level set in February 1966. From a starting point of 959, the Dow Jones gained 5 points Tuesday, following a market holiday on Nov. 11, Veterans Day. It rose another 3 points Wednesday but lost an equal amount in profit taking Thursday. The Dow continued its rise Friday gaining 2 points.

During the same week Standard & Poor's industrial average rose 1.76 (1.55%) to close at 115.06; the New York Stock Exchange composite average, 1.18 (2.02%) to 59.65; the American Stock Exchange price index, 72 cents (2.36%) to $31.28; and the N.Q.B. over-the-counter industrial average, 5.18 (1.29%) to 406.18.

All five *Computerworld* sector indexes gained ground during the week. The Software & EDP Services sector led the way with a gain of 17 points (8.21%) to close at 224. The Leasing sector closed at 127, up 8 points (6.72%); Peripherals & Subsystems, 133, up 7 points (5.55%); Computers, 129, up 5 points (4.03%). The Supplies & Accessories sector, the only one to lose ground in the previous week, gained only 1 point (0.87%) last week to close at 116.

More Stocks Up Than Down

More *Computerworld* listed stocks gained ground than lost it for the first time since the week ended Oct. 18. Seventy-three stocks rose last week, 25 fell, and 5 were unchanged. The previous week only 42 were up, while 46 were down, and 15 were unchanged.

Eight *Computerworld* listed stocks closed at new highs for the year. Five came from the Software & EDP Services sector: Applied Data Research, Computing & Software, Datamation Services (which had set a new high the previous week), Planning Research, and University Computing. Others included Leasco, U.S. Leasing, and Wallace Business Forms.

22 Make Big Gains

Gains of 10% or more were made by twenty-two stocks, compared with five in the previous week. Nine of the 22 gained 15% or more, and four of the nine gained 25% or more.

Collins Radio was the only stock in the Computer Systems sector to make a big gain, closing at 66-1/2, up 6-5/8 (11.06%).

Seven stocks in the Peripherals & Subsystems sector moved ahead briskly. Digitronics led the way with a gain of 4-3/4 points (26.76%). Bunker-Ramo, actively traded last week, rose 2-1/4 (14.88%); Tally, 5 (14.29%); Alphanumeric, 6 (12.00%); Sanders, 6-1/4 (11.31%); Mohawk, 6-3/4 (10.76%); Rixon, 2-1/4 (10.40%).

Wallace Business Forms was the only big gainer in the Supplies sector, rising 5-1/2 (17.19%) to close at 37-1/2.

Eight stocks in the Software & EDP Services sector were up sharply. Automation Sciences had the second biggest gain in the table, jumping 3-1/4 (28.26%). Computer Usage, which recently released a favorable earnings report, rose 7-1/2 (25.00%). Strategic Systems gained 4 points (17.39%).

COMPUTER STOCKS: TRADING SUMMARY

Week Ended November 15, 1968

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	COMPUTER SYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	163 3/8	239—157	232	* Burroughs	+ 12	+ 5.45	+ 42.00
NYSE	67 3/4	110— 54	66 1/2	Collins Radio	+ 6 5/8	+ 11.06	— 1.85
NYSE	101 1/2	174— 95	141 3/4	* Control Data	+ 6 1/8	+ 4.52	+ 39.65
AMSE	102	160— 95	149 1/2	* Digital Equipment	+ 6 1/2	+ 4.54	+ 46.57
NYSE	87 1/4	100— 81	96 3/4	General Electric	+ 1 3/8	+ 1.44	+ 10.89
NYSE	60	91— 59	87	Hewlett-Packard	+ 2 3/4	+ 3.26	+ 45.00
NYSE	93 1/8	144— 89	119 1/8	* Honeywell	+ 4 1/8	+ 3.59	+ 27.92
NYSE	288 1/2	375—280	327	* IBM	+ 11 3/4	+ 3.73	+ 13.34
NYSE	103 7/8	153— 40	121 3/4	* National Cash Register	+ 1/4	+ 0.20	+ 17.21
NYSE	46 7/8	55— 44	47 1/2	RCA	— 1/2	— 1.04	+ 1.33
NYSE	39 1/8	53— 34	48 5/8	Raytheon	+ 3 3/8	+ 7.46	+ 24.28
OTC	22 1/2	66— 20	35	* Scientific Controls Corp	— —	— —	+ 55.55
NYSE	78 3/4	114— 72	90	* Scientific Data	+ 6 3/4	+ 8.11	+ 14.28
NYSE	45	63— 42	45 3/4	* Sperry Rand	+ 1	+ 2.23	+ 1.67
AMSE	22 1/2	39— 20	29 3/8	* Systems Engineering Labs	+ 2 3/8	+ 8.80	+ 30.55

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	PERIPHERALS & SUBSYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	58 3/8	91— 52	83	Addressograph-Multigraph	+ 5 1/2	+ 7.10	+ 42.18
OTC	21	85— 45	56	Alphanumeric	+ 6	+ 12.00	+166.67
NYSE	29	38— 26	36 3/8	Ampex	+ 2 1/8	+ 6.20	+ 25.43
OTC	17 1/4	27— 14	14 3/4	Bolt, Beranek & Newman, Inc.	— 1/4	— 1.67	— 14.49
NYSE	13 1/2	20— 12	17 3/8	Bunker-Ramo	+ 2 1/4	+ 14.88	+ 26.70
AMSE	32 1/8	50— 27	38 3/4	* Calcomp	+ 2 3/4	+ 7.64	+ 20.62
OTC	24 1/2	49— 20	37	Cognitronics	— 1/2	— 1.33	+ 51.02
OTC	12	18— 10	15 1/4	Computer Equipment	+ 1/2	+ 3.39	+ 27.08
AMSE	15 1/4	23— 13	18	* Data Products	— 1 1/2	— 7.69	+ 18.03
OTC	19 1/4	27— 16	22 1/2	* Digitronics	+ 4 3/4	+ 26.76	+ 17.19
OTC	39	57— 32	51 1/4	* Electronic Memories	+ 3 1/4	+ 6.77	+ 31.41
OTC	10	29— 9	12 3/8	* Fabri-Tek	— 3/8	— 2.94	+ 23.75
OTC	34	35— 14	28 1/2	Gerber Scientific	+ 1 1/2	+ 5.56	— 16.18
OTC	12 1/2	26— 10	21 3/4	Information Displays	+ 1/4	+ 1.16	+ 74.00
AMSE	16 7/8	52— 14	27	Milgo Electronics	— —	— —	+ 59.97
AMSE	57 1/2	108— 54	69 1/2	* Mohawk Data Sciences	+ 6 3/4	+ 10.76	+ 20.87
OTC	74	145— 71	126	* Optical Scanning Corp.	— 1	— 0.79	+ 70.27
OTC	18	42— 16	33	Photon	+ 1/2	+ 1.54	+ 83.33
AMSE	25 5/8	38— 12	32 7/8	* Potter Instrument	+ 1/8	+ 0.38	+ 28.30
OTC	40 1/4	99— 38	79	* Recognition Equipment Corp.	— 2	— 2.47	+ 96.27
AMSE	16	29— 14	23 7/8	Rixon Electronics	+ 2 1/4	+ 10.40	+ 49.22
NYSE	46 1/8	66— 42	61 1/2	Sanders	+ 6 1/4	+ 11.31	+ 33.33
OTC	47	155— 53	80	Scan-Data	+ 5	+ 6.67	+ 70.21
OTC	40 1/2	51— 35	40	* Tally Corp.	+ 5	+ 14.29	— 1.24
NYSE	242 1/4	321—229	273	Xerox	+ 9 1/4	+ 3.51	+ 12.69

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SUPPLIES & ACCESSORIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	48 1/2	64— 37	44 1/4	* Acme Visible	+ 3/4	+ 1.14	— 8.76
NYSE	20 1/2	32— 18	19 1/4	Adams-Millis	+ 3/4	+ 4.05	— 6.20
OTC	13 5/8	22— 13	19 1/4	* Baltimore Busin.s Forms	— 1 1/2	— 7.23	+ 41.28
AMSE	27	44— 21	26 3/4	* Barry Wright	— 1	— 3.60	— 0.93
OTC	31 1/4	40— 26	36	Data Documents	— 1/2	— 1.37	+ 15.20
OTC	27 1/4	38— 26	38 1/4	* Ennis Business Forms	+ 1	+ 2.68	+ 40.37
NYSE	84 1/8	119— 81	109	* 3M Company	— 1/8	— 0.15	+ 29.57
NYSE	58	93— 48	81 3/4	* Memorex	+ 4 3/4	+ 6.17	+ 40.95
OTC	27 1/4	32— 25	29 1/2	* Moore Business Forms	+ 1/2	+ 1.72	+ 8.26
NYSE	57 1/4	85— 47	79 3/4	Nashua Corp	+ 3/4	+ 0.95	+ 39.30
OTC	31 1/4	56— 40	47	Reynolds & Reynolds	+ 2	+ 4.44	+ 50.40
OTC	34 1/2	35— 24	26 3/4	* Standard Register	— 1/4	— 0.93	— 22.46
NYSE	37 3/4	44— 30	34 1/4	* Uarco	— 1/4	— 0.73	— 9.27
AMSE	14 1/4	23— 13	20 1/8	Wabash Magnetics	+ 1 1/8	+ 5.92	+ 41.23
OTC	25 3/4	37— 24	37 1/2	* Wallace Business Forms	+ 5 1/2	+ 17.19	+ 45.63

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SOFTWARE & EDP SERVICES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	7 1/2	25— 7	16	Advanced Computer Techniques	— 1/2	— 3.03	+113.33
OTC	17	36— 14	36	* Applied Data Research	+ 1 1/2	+ 4.35	+111.76
OTC	15 1/2	23— 13	14 3/4	* Aries	+ 1 3/4	+ 13.46	— 4.84
AMSE	47	64— 42	64 7/8	Automatic Data Processing	+ 3 1/8	+ 5.06	+ 38.03
OTC	4	19— 4	14 3/4	Automation Sciences	+ 3 1/4	+ 28.26	+268.75
OTC	4 1/2	23— 3	16 1/2	* Brandon Applied Systems	+ 1 1/2	+ 10.00	+266.67
AMSE	22 7/8	43— 19	21 1/4	Computer Applications	+ 1 5/8	+ 8.28	— 7.10
OTC	5	15— 7	11	Computer Environments	— 1	— 8.33	+120.00
OTC	30	64— 24	58	Computer Network	— —	— —	+ 93.33
AMSE	40	64— 36	59 3/8	* Computer Sciences	+ 3 5/8	+ 6.50	+ 48.44
OTC	39	62— 28	37 1/2	* Computer Usage	+ 7 1/2	+ 25.00	— 3.85
AMSE	36 1/2	81— 36	81	* Computing & Software	+ 8 1/2	+ 11.72	+121.92
OTC	12 1/2	23— 5	23	Datamation Services	+ 1 1/2	+ 6.98	+ 84.00
OTC	14 1/2	22— 10	16 1/2	Datatab	— 1	— 5.13	+ 27.59
OTC	12 1/2	20— 9	11 1/2	* Digitek	+ 1	+ 9.52	— 8.00
AMSE	38 3/8	52— 26	29 3/8	Electronic Computer Prog. Inst.	— 7/8	— 2.89	— 23.45
OTC	35	68— 32	65	* Informatics	+ 2	+ 3.17	+ 85.71
OTC	21	28— 4	19	Matrix Corp.	+ 1 1/2	+ 8.57	— 9.52
OTC	5	28— 4	26 1/2	* National Computer Analysts	+ 2 1/2	+ 10.42	+430.00
AMSE	31	59— 28	59 1/2	Planning Research	+ 5	+ 9.17	+ 91.93
OTC	a13 1/4	a15— 13	13 1/4	Programming & Systems	— 1 1/2	— 10.17	— —
OTC	9	15— 8	10 3/4	Software Systems	+ 1/4	+ 2.38	+ 19.44
OTC	a29 1/2	a29— 8	27	Strategic Systems	+ 4	+ 17.39	— 8.48
OTC	20 1/2	22— 11	11 3/4	TBS Computing Centers, Inc.	— 1	— 7.84	— 42.68
OTC	a12	a12— 10	10	United Data Centers	— 3/4	— 6.98	— 16.67
OTC	63	182— 57	182	University Computing	+ 22	+ 13.75	+188.85
OTC	a20	36— 20	32 1/2	URS Systems Corp.	+ 3/4	+ 2.36	+ 62.50
OTC	a30	a30— 24	19	U.S. Time-Sharing	— —	— —	— 36.67

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	LEASING COMPANIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	18	55— 18	49	Boothe Computer	— —	— —	+172.22
OTC	4 1/4	24— 4	18	Computer Exchange	+ 4	+ 28.57	+323.53
AMSE	25 1/8	36— 21	24 3/8	* Computer Leasing	+ 1/8	+ 0.51	— 2.99
OTC	12 1/4	19— 11	12 3/8	* Cyber-Tronics	+ 1 5/8	+ 15.12	+ 1.02
AMSE	106 5/8	184— 88	119 1/4	* Data Proc. Financial & General	+ 6 1/4	+ 5.53	+ 11.84
OTC	12 1/2	17— 8	8 3/4	Datronic Rental	— 3/4	— 7.90	— 30.00
OTC	20	59— 18	49	Dearborn Computer	+ 7	+ 16.67	+145.00
OTC	13 1/4	19— 12	14 3/8	* DPA, Inc.	+ 1/8	+ 0.88	+ 8.49
AMSE	28 3/4	43— 25	26 1/4	* Greyhound Computer	— 1 1/8	— 4.14	— 8.70
AMSE	28 1/8	69— 36	43 1/2	Granite Equipment Leasing	— 3/8	— 0.86	+ 54.67
AMSE	49	126— 41	126	* Leasco	+ 19 1/8	+ 17.89	+157.14
OTC	5	14— 5	8 3/4	Lectro Computer Leasing	— 1/2	— 5.41	+ 75.00
AMSE	30 3/4	66— 27	56 5/8	* Levin-Townsend Computer Corp.	+ 2 3/4	+ 5.10	+ 84.14
OTC	10 1/2	16— 7	8 1/4	* LMC Data, Inc.	+ 1/4	+ 3.12	— 21.43
OTC	10 7/8	16— 10	14	* Management Assistance	— 1/4	— 1.76	+ 28.73
AMSE	41 5/8	53— 25	37 3/8	National Equip. Rental	+ 3	+ 8.73	— 10.20
OTC	13 1/4	14— 8	11 1/4	NCC Leasing	+ 1/2	+ 4.65	— 15.10
AMSE	38	64— 35	41 3/4	* Randolph Computer Corp.	+ 3 1/2	+ 9.15	+ 9.87
OTC	10 1/2	53— 10	47	System Capital Corp.	+ 5	+ 11.90	+347.62
AMSE	10 7/8	24— 10	24	U.S. Leasing	+ 3/4	+ 3.22	+120.69

a—Since 10/18/68 *Companies included in Computerworld's stock trading index for each sector.

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MORE BUY SELL SWAP ON PAGE 10

NOTICE TO ADVERTISERS

There's still time to let Computerworld sell for you at the Fall Joint.
The monthlies are closed by now, but Computerworld's 2 FJCC issues are still open:

The Preview issue closes Friday, November 29 for space, and Monday, December 2 for copy. It hits the mails Wednesday, December 4.

The Show issue closes Tuesday, December 3 for space, and Thursday, December 5 for copy. It hits the mails Wednesday, December 11.

3000 of each will be distributed at the FJCC from the Computerworld booth, and both will be right up to the minute with the news of the industry.

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That's a Lot of Bull

Keypunchers at the American Royal Livestock Show, Kansas City, Mo., wait for the judges to give them data on Hereford bulls. The card readers were connected to an IBM 1130 in a nearby truck, and the winners were computed on-site for the first time.

College Offers Full DP Course

OGDEN, Utah – Weber State College has received authorization from the Utah State Coordinating Council on Higher Education to offer a four year program in data processing. Students completing the program will receive a Bachelor of Science Degree in Data Processing.

The program is oriented towards business data processing and includes a core requirement in accounting. Students may, however, select any course in filling their minor requirement. The four year program is an addition to a two year technical program in data processing which has been in existence for five years.

There are at present 275 students enrolled in the program, with the earliest graduates expected in the spring of 1970.

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Delta Provides Contract Cost Control System

COLLEGE PARK, Md. – Delta Data Systems has announced a Contract Cost Control System designed to provide necessary management tools for controlling direct labor costs in a high volume environment.

The basic system provides an up to date analysis of each active contract together with all the contract budget data to allow management to supervise each active project from inception to completion, Delta said.

Mortgage Program Offered By University Computing

DALLAS – University Computing Co. is offering mortgage banks and loan companies a new accounting service employing the Marc II programming system.

Services

The software package, a combination of about 50 special routines written for the Honeywell 200, can handle automatic transfer of sold loans, daily loan history and collection reports, automatic escrow advance and recovery, daily trial balance listings and positive control of tax payments, multiple investor ownership, and declining participation schedules, as well as loan, investor, tax and legal, payee, and name and address master files.

The service is offered through Computer Utility and Data Link Division centers.

Fertilizer Mixing Program Developed by Chicago Firm

CHICAGO – Computer Management Consultants has developed a time sharing program to determine the optimal formulas for fertilizer bulk blending and granulated mixing operations.

The company says the program – which has applications in the baking, chemical, and candy industries – meets all quality and manufacturing specifications while at the same time guaranteeing that the combination of materials used in a given formula costs less than any other possible combination of the same ingredients tested.

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Survey Shows Variance in Time Cos

Special to Computerworld

NEW YORK – A newsletter issued by Time Brokers Inc. reported that prices for computer time on a specific configuration vary considerably over the United States – but not enough for it to recommend jobs being shipped from one city to another to take advantage of the lower rates. The newsletter also reported that the price for 360/30 time was dropping fast – and that it expected that it would drop further during the next six months.

The report provides a detailed comparison of the 32K and 65K 360/30 market. Using the number of tape or disk drives as a measure of "value received," it points out that a year ago an hour of 32K time was available for $10.50 multiplied by the number of peripherals. This was only slightly under the equivalent figure for 65K 360/30 time, which was $11. Now, however, there has been a 20.5% drop in the 32K prices while there has only been a 9.5% drop in the 65K prices.

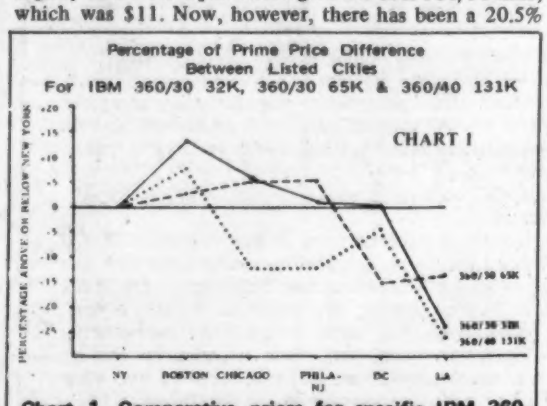

Chart 1. Comparative prices for specific IBM 360 configurations across the country. Note that Boston (at 10-15% above New York) appears to be the most expensive area, with Los Angeles (at up to 25% lower than New York) the cheapest.

Compatibility

The newsletter continues that compatibility continues to be a persisting problem. "It is ironic," it says, " that when the IBM 360 was first announced, it was hailed as a computer with both upward and downward compatibility, yet it comes in so many versions that, from the standpoint of time sales, it is harder to match than most other computers.

"Sometimes it is a question of 1401 compatibility feature, or possibly the tape drives are 7 track, when the buyer requires 9 track format. It may also be that the seller uses the wrong tape density, or lacks any one of the many special features. A similar problem is the nonstandard method of assigning addresses in the operating system. Buyers are often irritated by finding that they cannot run on a system with identical configuration to theirs, just because the assignments are different. Finally, failures may occur because different releases of the operating system are used."

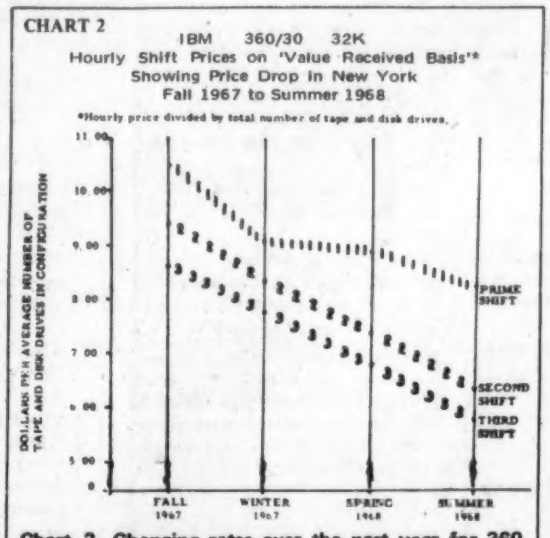

Chart 2. Changing rates over the past year for 360 32K systems in New York. Note that the prices are given "per peripheral." A four tape system, therefore, could have been expected to rent for $42/hour in the fall of 1967, and only $36/hour now..

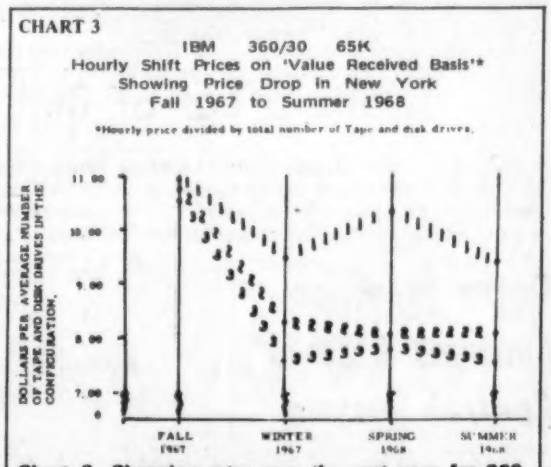

Chart 3. Changing rates over the past year for 360 65K systems in New York. Note that the drop in prime shift charges "per peripheral" is not so steep as it was for the 32K configurations.

Among those present at the dedication of MIT's new Information Processing Center were, left to right, Patrick J. McGovern, publisher of *Computerworld*; Thomas J. Watson, Jr., IBM chairman; Richard G. Mills, MIT's director of information processing services; and Howard W. Johnson, president of MIT. Mills, formerly assistant director of Project Mac, was appointed to the new post last year. He is responsible for coordinating all information processing facilities at MIT.

MIT Dedicates New Computer Center

(Continued from Page 1)

moved from Project Mac into the new building.

IBM Chairman Thomas Watson, Jr., the featured speaker at the dedication luncheon, reviewed the close association between IBM and MIT. This grew out of an awareness that to expand the use of computers one needed to have available a trained body of professional people able to do programming and systems analysis for the customer. With this in mind, an initial IBM 704 computer was provided to MIT in 1956.

Watson also noted that IBM has paid dearly for not being close to MIT's research efforts in the past. He related that IBM's engineers were not enthusiastic about the possible use of the ferrite core as a computer memory component – adopting a "not invented here" attitude. This proved a rather costly bit of pride, for IBM has paid MIT over $13 million in royalties for use of the magnetic core memory.

Watson also cautioned his audience to maintain a high respect for the human mind. He noted that computers cannot judge the morality of what they do; they have neither compassion nor sympathy. The destiny of our times, he said, is for man, not machines, to decide.

Firm to Act as Lease-Back Agent

SUMMIT, N.J. – A new company, Summit Computer Corp., has been formed here to act as exclusive agent for Transamerica Computer Co. in obtaining IBM 360 purchase lease-back business in the Greater New York City area.

The company also will lease used equipment.

Compusamp to Distribute Product Samples 'Logically'

NEW YORK – Compusamp, Inc., a new company formed to provide computer based marketing services to packaged goods companies, has a service designed to distribute product samples only to potential users by weeding out of a list those who already use the product or have no need of it.

A prototype program is being set up for January to include 20,000 households in Nassau, Suffolk, and Queens Counties in New York, the company said.

Managematics Opens Doors In NYC to do Consulting

NEW YORK – A new management science and computer technology consulting firm, Managematics, Inc., has opened its offices here.

Erving Katz and Raymond P. Wenig, both formerly consultants with C-E-I-R, Inc.'s Professional Services Div., are president and vice president, respectively.

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